Fire ecology has been a burning issue through the ages

LLNL's wild side

By Jim Woolett

Fire has been linked to the natural dynamics that historically have shaped plant communities and animal populations throughout California. Fire became a tool commonly used by early inhabitants of the state to promote: effective hunting for big game; improvements of the landscape for dwellings and cultural activities; and curtailment of pest and disease outbreaks.

Recent catastrophic, fire-related events across the state have drawn attention to "adequate fuel" (e.g., woody debris) reduction and management practices. Many federal and state institutions with land management responsibilities are studying new aspects of fire ecology as well as the history explaining how the flora communities and vegetation types currently found in the state established themselves.

Annual burning at Site 300 takes place to protect the area from potential out-of-control wildfires.

Prescribed fire treatment is a method of reducing hazardous natural fuels in an area and/or rejuvenating vegetation to reach a targeted, ecological result. For instance, fire may be used by an agency to regenerate timber stands in areas that have been previously logged and that require an environmental stimulant to promote restoration and reforestation of the land.

Prescribed burning is an annual landscape management procedure implemented at the Laboratory's Site 300 under carefully planned, permitted and monitored conditions. Specific buffer areas of grassland habitat are burned to protect site facilities from the hazards of wildfire during dry summer conditions. Consistent with the practice, these grassland habitats display healthy suites of native plants not visible in other areas of the property. Fire frequency in this region of California has historical precedent. Native wildlife species have developed particular adaptations to survive in these fire-driven ecosystems.

Evidence suggests that the native people of this region of California (the interior coastal region) substantially altered the early vegetation communities from patchy shrublands to grasslands through the use of routine, prescribed fires. Widespread chaparral shrublands are believed to have existed at this location in early times. In many cases, this chaparral formed dense, nearly impenetrable stands.

For native people, these stands represented an obstacle to food resources, made travel difficult, sheltered large predators such as grizzly bears and mountain lions, and consumed much of the surface spring water available. Incorporating fire into their lifestyle allowed these people to "farm" for seed-producing plants that responded to burned areas and subsequently yielded high quality food sources similar to an agricultural effort. Animals such as deer, quail and rabbits, which preferred the more open environment, were drawn to these areas, providing important food sources for local inhabitants.

Colonial Spanish missionaries who immigrated to California in the late 1700s are believed to have discovered an open landscape in the interior coastal range ripe for livestock and farming. With the release of European cattle, many of the plants that had occupied burned shrubland areas were taken over by non-native grasses introduced with the old world animals. These exotic grasses produce the "golden" hills that now typify California topography.

Many of California's wildlife species have adapted to avoid the hazards of the dry season when vegetation fuel levels are highest and most flammable. Ground-nesting birds typically nest early in the season when moisture is still present in plants close to the soil surface. Small mammals may "hibernate" or estivate during the summer in grassland or chaparral areas that have been burned and that lack adequate food. Larger, herbivorous mammals migrate to the high ground in the winter for succulent grasses and associate with lower, wetter climates in the summer. Many of the smaller, more prolific animal species live underground or shelter in rock outcrops, safe from the heat of a fire.

Fires have guided the adaptations present in California plant life and animal communities. Restoring fire cycles in some areas may help safeguard human life and property and sustain wildlife diversity in the interior coastal ecosystems far into the future.